

# HARRISBURG TRANSPORTATION CENTER POWER DIRECTOR'S OFFICE



To help preserve and publicize the history of the Harrisburg Transportation Center amid ongoing Americans with Disabilities Act (ADA) and other general station improvements, and to meet the requirements of a Memorandum of Agreement executed in 2017 under Section 106 of the National Historic Preservation Act of 1966, this booklet was prepared by the Pennsylvania Department of Transportation in Cooperation with:

- U.S. Department of Transportation, Federal Transit Administration (FTA)
- Pennsylvania Historical and Museum Commission, Pennsylvania State Historic Preservation Office (PHMC)



Pennsylvania State Historic Preservation Office  
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

## IMAGE CREDITS

All color photographs of the Power Director's Room and Harrisburg Station, as well as the contemporary illustrations of the equipment of the Power Director's Room are courtesy of Johnson, Mirmiran and Thompson.

### Other image credits are as follows:

**Harrisburg Power Director's Office, 1985.** (Cover) HAER No. PA85-22. Courtesy of the Library of Congress, HAER Collection.

**World's Fair, railroad exhibit locomotives. Pennsylvania Railroad 6759, general view.** (Page 4) Courtesy of the Library of Congress, Gottscho-Schleisner Collection.

**GG1 Locomotive No. 4859.** (Page 4) Courtesy of the Pennsylvania Museum and Historical Commission.

**Friend & Aub, and Pennsylvania Railroad. Map of Pennsylvania Railroad with its connections, showing the different routes, projected or constructed between the seaboard & the western states.** (Page 5) [Philadelphia, 1851] Map. <https://www.loc.gov/item/98688762/>.

**Harrisburg Power Director's Office, 1985.** (Page 6) HAER No. PA85-21. Courtesy of the Library of Congress, HAER Collection.

**Construction of the 1936 Addition to the Harrisburg Transportation Center.** (Page 7) Courtesy of the State Archives of Pennsylvania.

**Westinghouse 60-Cycle Transformers** (Page 10). WESCO Electrical Equipment & Supplies (Westinghouse), 1959.

**Polaricode JR advertisement** (Page 10). Coal Age Magazine, 1934.

**The Pennsylvania Railroad Electrified Territory Power System Operating Diagram** (Page 11). Pennsylvania Railroad Office of Electrical Engineer, 1971.

# POWER DIRECTOR'S OFFICE AT HARRISBURG TRANSPORTATION CENTER

The Power Director's Office at Harrisburg Transportation Center was designed and constructed as part of the Pennsylvania Railroad's (PRR's) program of electrification on its main line, which spanned from Philadelphia to Harrisburg.

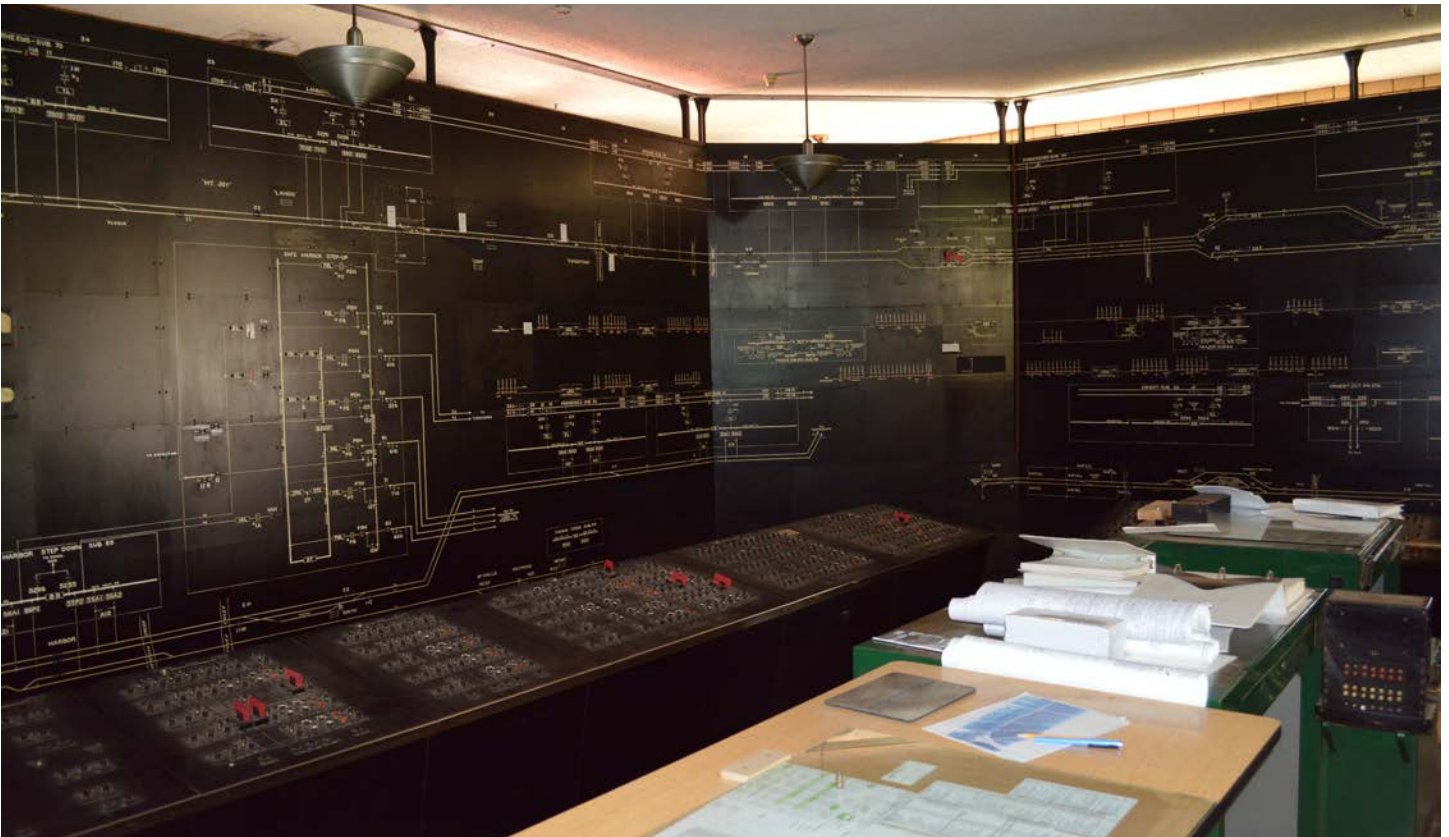
Beginning in 1937, a two-story addition to the PRR's Harrisburg Passenger Station was erected at the southern end of the building in conjunction with the electrification of the railroad line. The addition was completed in 1938 and was designed to house

equipment to control the electrical power supply to the system on the second floor.

The equipment on the second floor was used by the PRR's Power Director to supervise all of the electricity needed to run the main line. This included the high-voltage power supplied to the catenary system, which powered the electric locomotives, as well as lower-voltage power for the switches, which moved trains from track to track, and the signals, which directed traffic.

A room on the first-floor housed interlocking equipment. That room was known as "State Tower" and it worked in conjunction with the nearby Harris Tower and other interlocking towers along the lines to control the switches and signals.

The equipment housed in these rooms at the Harrisburg Passenger Station was integral to the operation of trains on the main line from its opening in 1938 until the system was converted to computerized controls in the 1990s.

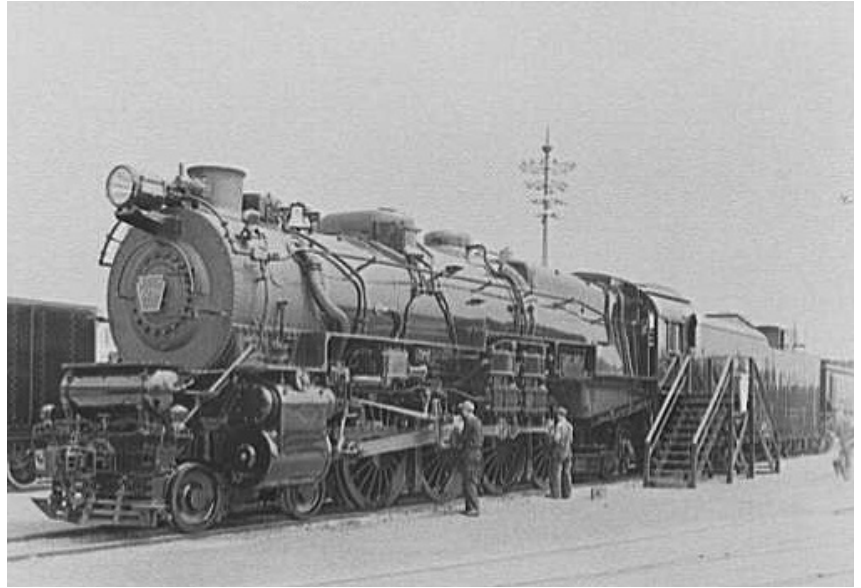


View of the Power Director's Room, Harrisburg Transportation Center, designed to control the electrical supply for portions of the electrified line between Philadelphia and Harrisburg, as well as various freight routes in the vicinity, as seen in 2018.

# ELECTRIC POWERED RAILROADS

The Pennsylvania Railroad Company was established in 1846 to develop a rail route across the state. By 1851, it linked Philadelphia with Pittsburgh, by way of Harrisburg. The current passenger station at Harrisburg was constructed in 1887 and was altered several times during the early 20th century.

The line from Philadelphia to Harrisburg began as a steam railroad – with steam-driven locomotives pulling both freight and passenger trains. Beginning in the early 20th century, interest in converting from steam to electric traction was growing among the owners of steam railroads in the United States.



Steam-power was the standard for locomotives on the Pennsylvania Railroad prior to the electrification of select lines in the early 20th century. Steam engines like the one seen above were used to pull both freight and passenger trains.



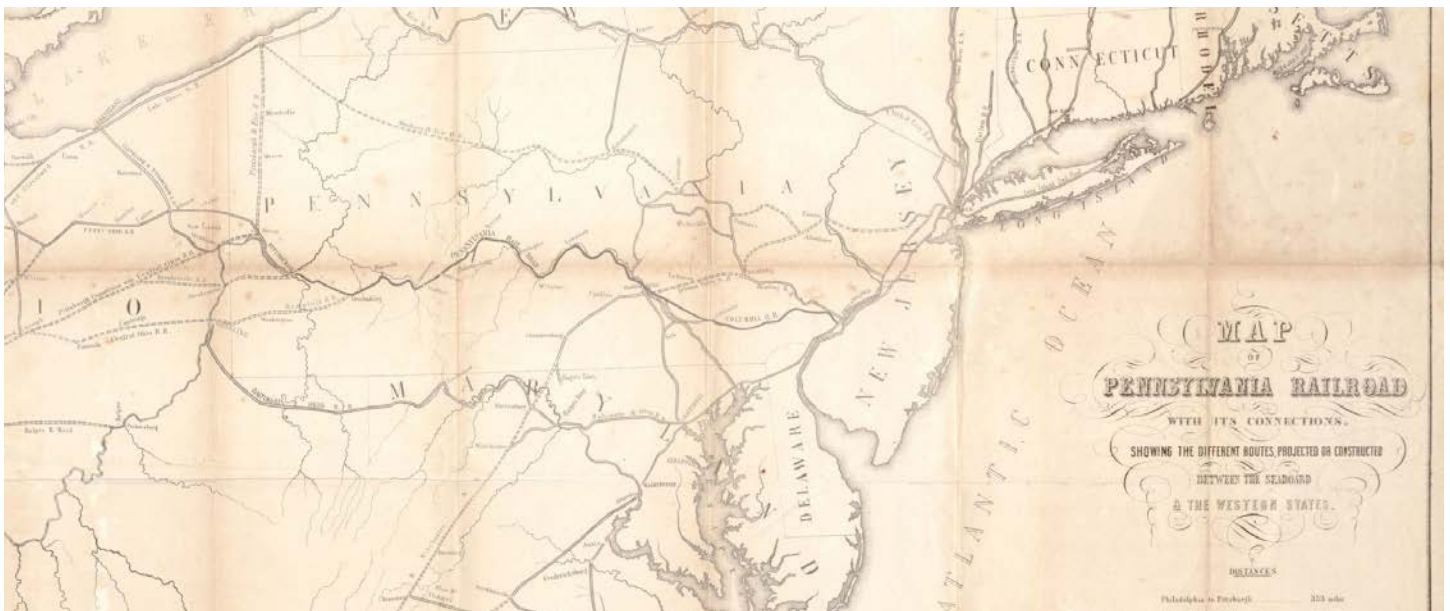
A fleet of 139 GG1 electric locomotives was produced for the PRR utilizing a modern, streamlined design in 1937. One of the fleet inaugurated the electrified service on the Philadelphia-Harrisburg: GG1 Locomotive No. 4859 (above), which has been preserved on Track 5 at the Harrisburg Transportation Center and is listed on the National Register of Historic Places, pulled the first electrically powered train over the route on January 15, 1938.

Electric locomotives had several advantages over steam-powered locomotives, primarily that an electric locomotive could produce more horsepower than a steam locomotive of the same weight by overloading its traction motors. These motors were designed to allow the production of approximately 75% more horsepower for short spans of time – such as when starting a train or ascending an incline. A steam engine had no capacity to build up reserve power – any extra steam produced by the engine's boilers in excess of the cylinder's capacity was wasted. This meant that an electric locomotive could easily start a heavy train that a steam locomotive couldn't move an inch and would be able to pull a heavy train up a steep grade while maintaining speed, while a steam engine pulling the same load would slow to a crawl or require assistance from helper engines.

Electric locomotives could run faster and pull larger loads, resulting in increased productivity. They also contained fewer moving parts than steam locomotives and were simpler to build. They didn't require coal or water to operate and didn't produce ashes as waste. Because of this, electric power could offer a reduction in operating and maintenance costs compared to steam power.

# THE PENNSYLVANIA RAILROAD'S ELECTRIFICATION PROGRAM

Despite the many advantages of electric over steam traction, multiple economic and technological factors prevented the widespread conversion from steam to electric traction on US railroads. The onset of the Great Depression hindered efforts to pursue electrification – installing an electrified system was an expensive endeavor. The PRR was also reluctant to attempt full-scale electrification, as there were so few examples of railroads using electric traction in the United States at the time. An ongoing debate in the country regarding the merits of alternating vs. direct electrical currents added to the confusion. Furthermore, the PRR was closely tied to the coal industry and refused to discount the possibility of developing a steam engine that could outperform an electric locomotive in the future. In spite of these misgivings, the PRR did end up electrifying a few of its lines in the early days of railroad electrification.



1851 map of the Pennsylvania Railroad showing the different routes, both projected or constructed between the seaboard & the western states as of that year. The PRR would go on to electrify only a portion of the routes shown here, including those between Philadelphia and Harrisburg.

The PRR's earliest electrification project was put into use in 1910. The PRR had electrified its line from Manhattan Transfer (Newark), New Jersey, through New York City, to Sunnyside Yard in Long Island in conjunction with a large tunnel and terminal development project. Electric traction, utilizing a direct current, low voltage third rail system, was chosen to power these lines because smoke and soot from coal powered trains would be incompatible with travel through the tunnels.

Shortly after, it was decided to use electrification in the area surrounding the PRR's terminal at Broad Street Station in Philadelphia in order to relieve severe traffic at the station. The company determined that converting the lines to electric traction utilizing an over-head high-voltage alternating current catenary system could relieve congestion at the station without the need to expand the terminal or construct additional tracks. The first electrification in the district spanned from Broad Street Station to Paoli, covering a distance of approximately 20 miles. It was completed in 1915. The remaining suburban Philadelphia commuter lines were electrified in the following years, including the Chestnut Hill Branch, in 1918, the line to White Marsh in 1924, the lines to Wilmington and West Chester in 1928, and the lines to Trenton and Norristown in 1930.

# THE PENNSYLVANIA RAILROAD'S ELECTRIFICATION AT HARRISBURG

In 1928, PRR President William Wallace Atterbury announced plans to begin long-distance electrification, with the intention to eventually furnish an electrified line as far west as Pittsburgh. Over the next ten years, the PRR electrified its route between New York, Philadelphia, Baltimore, and Washington, as well as the Main Line from Paoli west to Harrisburg. Ultimately, Harrisburg was as far west as the PRR went with the electrification of its passenger lines. In 1937, the PRR authorized the electrification of all of the main passenger and freight routes east of Harrisburg. The power to these lines eventually would come under control of the Power Director at Harrisburg.



The catenary support structures, seen in the foreground of this photograph, were constructed by the Pennsylvania Railroad during the 1930s electrification program.

The Harrisburg Power Dispatcher's Office was constructed to monitor and control all of the power supply on the electrified territory between Harrisburg and Paoli on the main line, as well as on the freight lines from Enola south toward Baltimore. Also under control of the Power Dispatcher at Harrisburg were the PRR's low-grade freight line, which provided a route for freight traffic coming from the New York and Philadelphia areas to travel west to the yards in Enola while avoiding hills encountered on the main passenger line. To control power across all of its electrified lines, the PRR constructed similar control rooms in Baltimore, Philadelphia, and New York.



The Power Director's Office, seen in operation in this 1986 photograph, was the point of control for the system in the area around Harrisburg from its inception in the 1930s through c. 2013.

# HARRISBURG'S SUPERVISORY CONTROLS

In 1936, in preparation for the project, the passenger and baggage bridges at Harrisburg Station were raised to create enough clearance to run the catenary lines through the station. The following year, a 60-foot addition was constructed at the south side of the passenger station. Harrisburg was to be a control point for electricity on the line, and the addition was designed to contain the power control equipment and associated personnel. The main floor housed interlocking equipment, to control signals and switches in conjunction with the nearby Harris Tower and other interlocking towers in the vicinity, while the second floor was devoted entirely to supervisory control of electrical power.

By 1938, the PRR had about 600 miles of its route under the electrified catenary system, utilizing an 11 kv, 25-hertz, single-phase system – the same type which was installed at Philadelphia c. 1915. While the PRR operated more electrified track mileage than any other railroad in the US from the 1930s through the end of its corporate existence in the late 1960s, the company never electrified its entire system. The lines between New York and Baltimore (and on to Washington DC) and between Philadelphia and Harrisburg continue to operate using the same systems put in place by the PRR in the early 20th century.



This addition, as seen under construction in 1936, was designed to hold interlocking equipment on the main floor, and the Power Director's Room on the second floor.

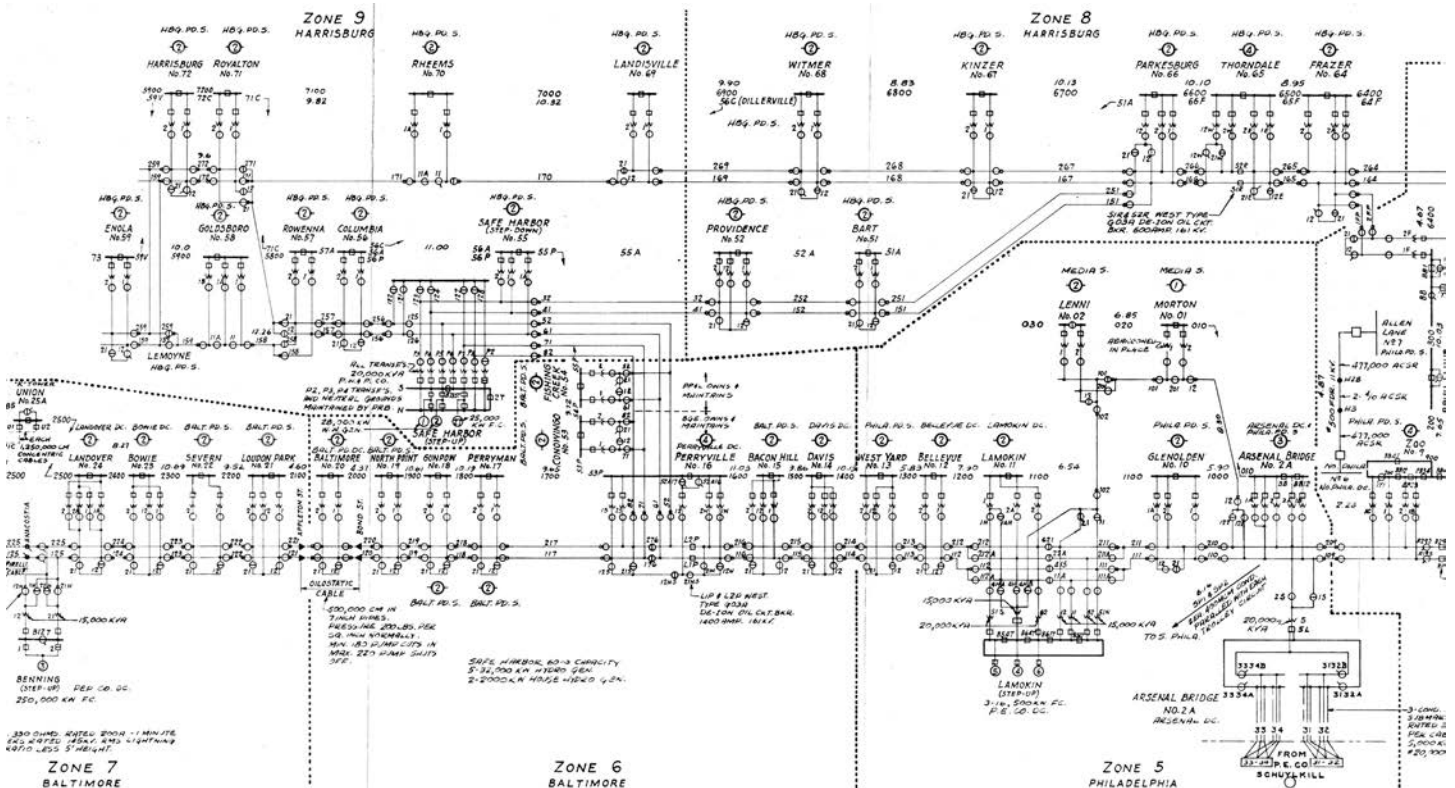


State Tower, housed on the main floor of the Harrisburg Transportation Center's 1936 addition houses this Model 14, Union Switch and Signal unit. The same equipment is used to control the interlockings at other points in the system from other nearby interlocking towers, including the Harris Tower.

# HARRISBURG POWER CONTROL SERVICE AREA

The PRR's electrified territory was divided into nine "zones" for power control – Zones 1, 2 and 3 were New York, Zones 4 and 5 were Philadelphia, Zones 6 and 7 were Baltimore, and Zones 8 and 9 were dedicated to Harrisburg. While New York, Baltimore, and Philadelphia all had Power Director's Office Supervisory Control centers similar to the one at Harrisburg, many of the substations in zones for those cities were controlled by local interlocking towers with supervisory control equipment. The Power Director's Office at Harrisburg controlled all of the substations within its zones.

The substations controlled at Harrisburg provided bulk power for service on a large portion of the Philadelphia to Harrisburg Main Line, as well as on significant portions of the Low-Grade Freight Routes between Harrisburg and Trenton and Enola and Conowingo, MD. Substations controlled by the equipment in the Power Director's Room at Harrisburg included Langhorne (Substation 61), Horsham (Substation 62), Frazer (Substation 64), Thorndale (Substation 65), Parkesburg (Substation 66), Kinzer (Substation 67), Witmer (Substation 68), Dillerville, Landisville (Substation 69), Rheems (Substation 70), Roylton (Substation 71), and Harrisburg (Substation 72). Substations controlled here on the freight lines included Bart (Substation 51), Providence (Substation 52), Safe Harbor Step-Down (Substation 55), Columbia (Substation 56), Rowenna (Substation 57), Goldsboro (Substation 58) and Enola (Substation 59).



The above section of the Pennsylvania Railroad Electrified Territory Power System Operating Diagram, produced by the PRR's Office of the Electrical Engineer and updated multiple times between 1942 and 1971, shows Zones 8 and 9, controlled by the Power Director's Office at Harrisburg. The diagram depicts switches, circuit breakers, transformers, and generators at substations within the system.

The Power Director at Harrisburg was in charge of power distribution within the electrified territory. The territory consisted of the portion of railroad, including main tracks, sidings, yards, and industrial tracks equipped for electric train operation by the catenary system, as well as the necessary substations, transmission lines, and signal power lines located above and adjacent to the tracks. Substations along the electrified territory received high-voltage power from the local utilities and utilize transformers to change the power to the voltages required for use by the catenary system and other electric apparatuses required for the function of the railroad.

The catenary system is a system of wires suspended between poles and bridges, which support overhead contact wire which are energized at 11,000 volts. These contact wires, sometimes called "trolley wires," supply power to the train via the pantograph. The pantograph is a device located at the top of a train car which collects electrical current from the contact

wire and directs it to the train's electrical systems to power the trains.

Circuit breakers at each substation, which were used to energize or de-energize the transmission lines, catenary system, and signal wires, were controlled remotely (opened or closed) by individual panels for each substation on the switchboards in the Power Director's Room. Open breakers at each substation would supply power to transmission lines which would in turn power the catenary system, as well as the signal power wires, which would power the signals.

One piece of equipment used to control the circuits within the substations along the line was the Polaricode JR, manufactured by Westinghouse Electric & Manufacturing Company in East Pittsburgh, PA. The Polaricode JR was able to transmit information on the status of circuits within the substation to an operator in the Power Director's Office through indicator lights which would turn on to indicate whether a circuit was open or closed.

**WESTINGHOUSE OIL IMMERSSED SUBSTATION TRANSFORMERS 671**  
 single phase - 60 cycles - 55°C rise - 250 to 500 kva

**type LD**  
 Westinghouse type LD and SL, oil-immersed, self-cooled, 60-cycle substation transformers are rugged, high efficiency units designed for outdoor applications. These transformers may also be applied indoors where adequate spacing is provided for free air circulation and where Underwriters' requirements permit.

**type SL**

These ratings are particularly adapted to industrial lighting, small power loads and substation distribution up to 1500 kva bank capacity.

- light tank construction:** Provides a rugged outline and with solid core welded steel external members. Tubular lead-type window have very high mechanical strength. Steel channel base insures stability even when the base is supported on rollers.
- best winding design:** For specific voltage and current requirements, the use of Dimping for ground insulation, double insulation primary winding or round wire primary winding is employed to achieve best design requirements.
- Mipercal® cruciform cores:** Give optimum magnetic qualities and low losses. No turns interlocked, space enclosed Mipercal, this material is able to carry 1/3 more flux per unit area than conventional silicon steel.
- weather-resistant Coastal® finish:** Also tanks are also finished to remove all traces of dirt and grease. Three coats of paint are applied by electrocoat. First is a prime coat of zinc chromate and zinc oxide for protection and corrosion-inhibiting properties, second, an intermediate coat of phenolic and alkyd resin with suspended iron flake for resistance to rust, oxygen, acids, alkalis and abrasion; third, a finish coat of weather-proof blue-gray enamel for best appearance and also to prevent the sun's damaging ultra-violet rays from reaching the primary and intermediate coats.
- standard accessories:** Provided for an additional level of protection, accessories are in accordance with the latest IEEE-MEMA standards.

**standard accessories**  
 The table below shows the standard IEEE-MEMA accessories for application. 60-600kva, oil-immersed transformer of standard tank design.

6000 lbs. 2 1/2" x 2 1/2" x 2 1/2"	100
10000 lbs. 3 1/2" x 3 1/2" x 3 1/2"	150
15000 lbs. 4 1/2" x 4 1/2" x 4 1/2"	200
20000 lbs. 5 1/2" x 5 1/2" x 5 1/2"	250
25000 lbs. 6 1/2" x 6 1/2" x 6 1/2"	300
30000 lbs. 7 1/2" x 7 1/2" x 7 1/2"	350
35000 lbs. 8 1/2" x 8 1/2" x 8 1/2"	400
40000 lbs. 9 1/2" x 9 1/2" x 9 1/2"	450
45000 lbs. 10 1/2" x 10 1/2" x 10 1/2"	500
50000 lbs. 11 1/2" x 11 1/2" x 11 1/2"	550
55000 lbs. 12 1/2" x 12 1/2" x 12 1/2"	600
60000 lbs. 13 1/2" x 13 1/2" x 13 1/2"	650
65000 lbs. 14 1/2" x 14 1/2" x 14 1/2"	700
70000 lbs. 15 1/2" x 15 1/2" x 15 1/2"	750
75000 lbs. 16 1/2" x 16 1/2" x 16 1/2"	800
80000 lbs. 17 1/2" x 17 1/2" x 17 1/2"	850
85000 lbs. 18 1/2" x 18 1/2" x 18 1/2"	900
90000 lbs. 19 1/2" x 19 1/2" x 19 1/2"	950
95000 lbs. 20 1/2" x 20 1/2" x 20 1/2"	1000

**typical installation**  
 (see below illustration of type LD transformer)

WESTINGHOUSE AGENT-DISTRIBUTOR

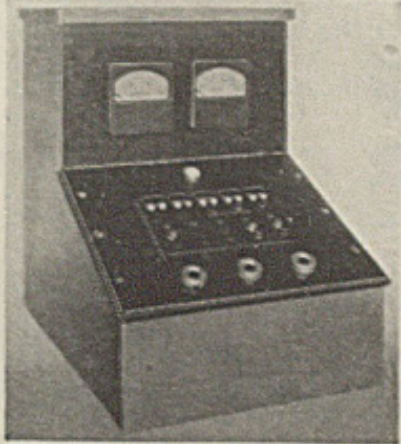
← The substations contained single-phase 60-cycle transformers, similar to those shown in the image at left.

The Polaricode JR, as seen in the advertisement (at right) from a 1934 issue of Coal Age Magazine, manufactured by the Westinghouse Electric and Manufacturing Company, was one piece of supervisory control equipment utilized by the employees of the Power Director's Office. →

◆

## Supervisory Control

To meet the need for an inexpensive means for remote operation of various small stations, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., offers "Polaricode, Jr.," said to be a low-cost small-sized supervisory control for industrial service. It includes a raise-lower control combined with simultaneous telemetering indication of position for distant control of variable-position apparatus. The equipment, according to the company, is designed for application to small-transformer switching, distribution and tie-point substations; various single-unit automatic railway, mining and hydro stations; electrified pumping stations; industrial plant substations; and similar applications. The unit operates a maximum of five apparatus units and requires only two telephone wires between the

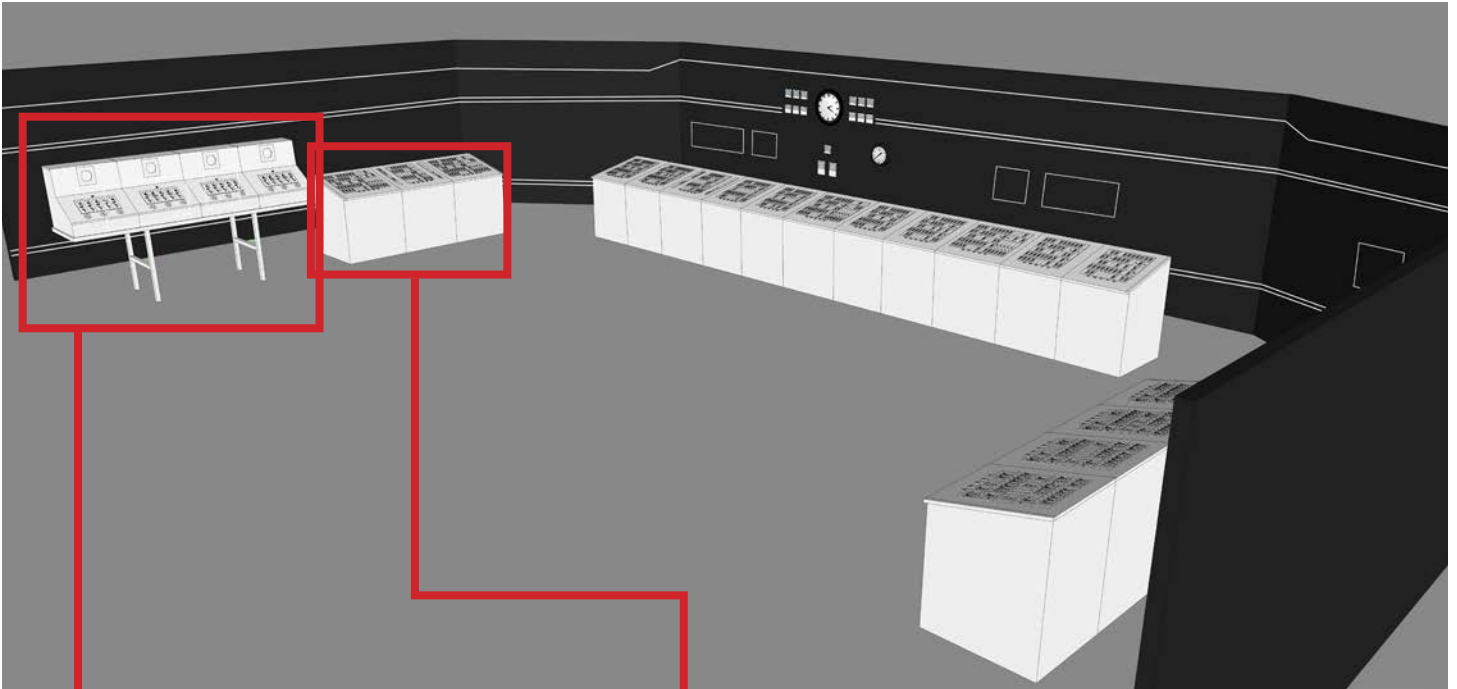


control station and the apparatus. All the functions of apparatus control, including continuous and individual signal lamp supervision, telemetering and synchronization, are performed by the equipment, according to the company.

◆

# POWER DIRECTOR'S ROOM EQUIPMENT

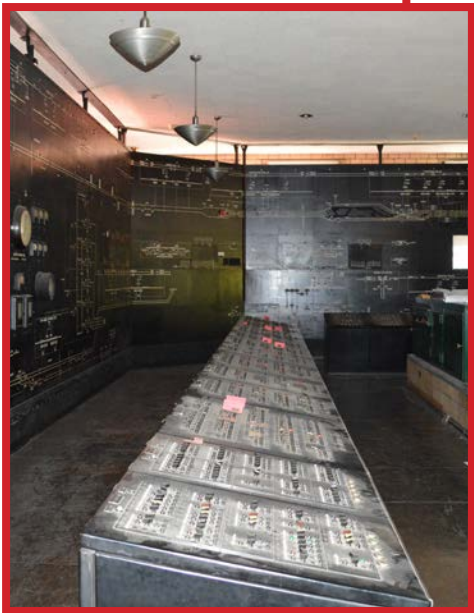
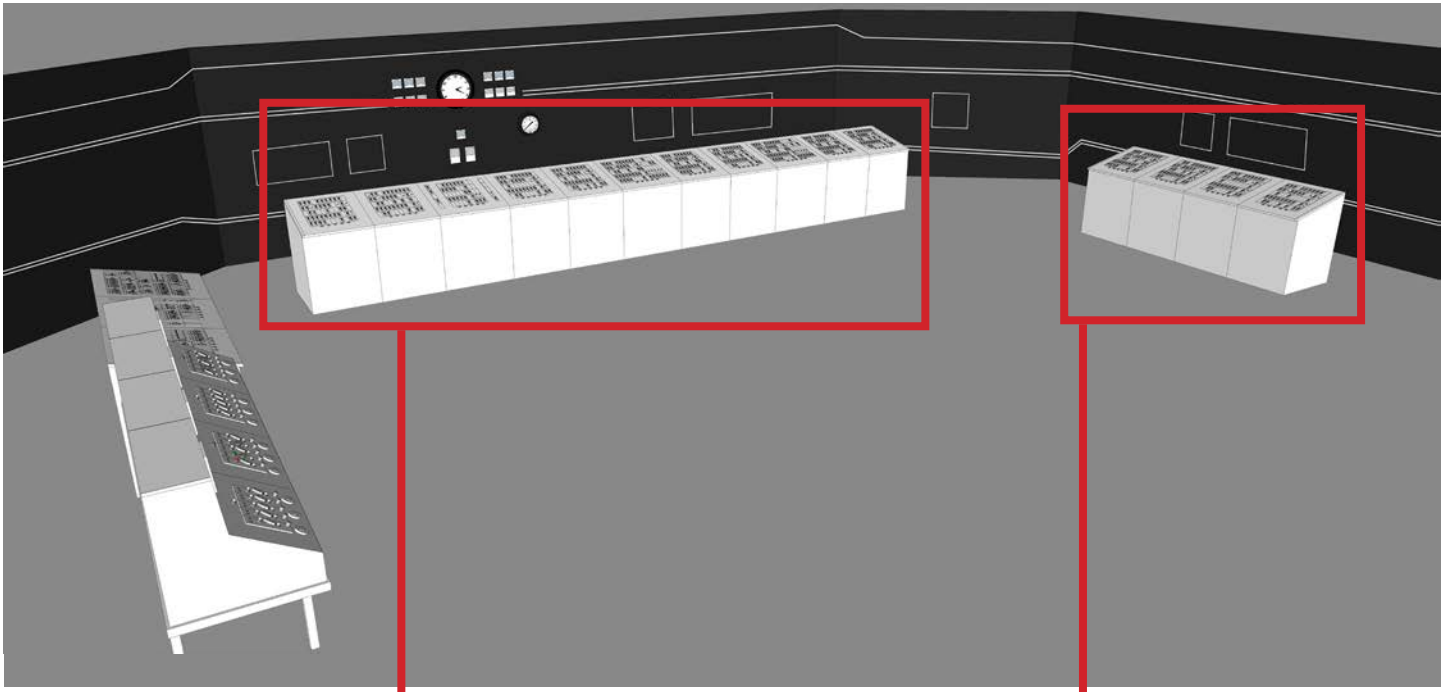
The supervisory control equipment located in the Harrisburg Power Director's Room was manufactured by both the General Electric Company and the Westinghouse Company. It consists of model boards which depict the power supply to the electrified territory controlled from the room. The model boards serve as a detailed diagram and display the status of various circuit breakers within the system using red and green indicator lights. The substations depicted on the model boards worked together with corresponding control panels on the Code Selection equipment benches on the Power Director's Room floor. The power direction staff sat in the center of the room facing the model boards and monitored the status of the system by viewing the various indicator lights on the diagram. They used the switches and keys on the control panels to direct power to the system by opening and closing the various circuit breakers.



The above model of the Power Director's Room's supervisory equipment shows Polaricode JR units (bottom left) and other Polaricode units (bottom right) manufactured by the Westinghouse Electric and Manufacturing Company as well as a depiction of the model boards with clocks and equipment manufactured by both Westinghouse and General Electric.

The Westinghouse Polaricode and the General Electric standard Code Selection systems operated in conjunction with one another, as well as with the General Electric model boards and telemetering equipment. They functioned on an all-relay system by GE housed in relay cabinets. The system used a single type of relay designed to run on 48 volts. The system communicated in a way similar to telephone equipment and, in fact required only two telephone wires to operate by sending signals between each substation and the remote control facility.

Each device in the substation which was subject to remote supervision has a corresponding set of control keys and indicating lamps on a control panel in the Power Director's Office. The keys and lamps are connected to small, multi-contact relays mounted to a control and relay panel located in one of the cabinets in the rear of the room. Corresponding relays located at the substation are wired to the circuit breakers to energize or de-energize auxiliary interposing power type relays which relay signals from the power director's control panel to in turn cause the devices in the remote substation to function and respond to the operations initiated by staff in the Power Director's Office.



The supervisory control units manufactured by Westinghouse feature a control panel for each power substation along the lines. The control units were specially configured to direct the function of various "apparatus" within each power station - including circuit breakers to turn power on or off, and transformers to convert high power to the appropriate voltage for operating the train equipment.

# THE WESTINGHOUSE POLARICODE JR CONTROL FUNCTIONS

The small white lamps with a black dot in the center are "disagreement lamps" which indicated to the operator that the position of the control key that the operator engaged does not agree with the position of the apparatus that the operator is attempting to control. For example, if the dispatcher twisted the control key to the "closed" position to close a circuit breaker at the substation and the corresponding disagreement lamp is lit, it indicates that the corresponding breaker in the substation has not closed.

The push-pull selection key was a locking key that was engaged to select an individual control point and its corresponding circuit breaker and ready it to perform an action (ex: to open or close) in response to the operation of the control key by the power director.

The master control key is the push-non-lock type designated "master control." This key, when depressed connected the selected individual control key to the operation control circuit. After the desired apparatus had been selected, the master control key was momentarily depressed to initiate the operation of the selected apparatus unit at the remote station.

The small white lamps on the control panels are "selection lamps" which indicated that the operator has engaged the corresponding piece of equipment by pulling out the associated selection key. When lighted, the equipment has been "selected" and is on standby, awaiting direction from the operator.

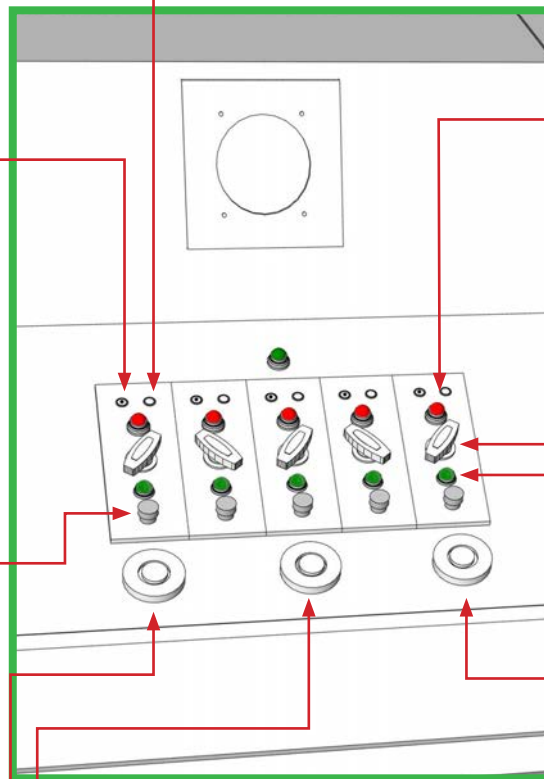
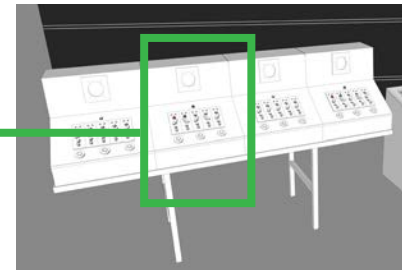
The large red lamps indicated to the power dispatcher that the corresponding circuit breaker at the substation was in the closed position.

The twist-type control key functioned to open or close the associated circuit breaker "trip" or "close" position.

The large green lamps indicated to the power dispatcher that the corresponding circuit breaker was in the open position.

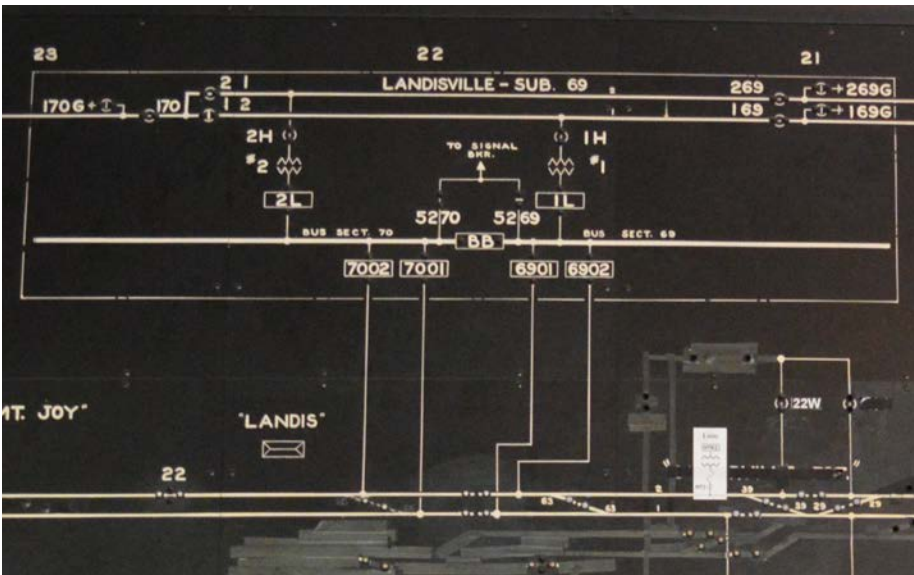
The reset key is a non-lock type key designated "Reset." This key was associated with the bell alarm circuit and effected the release of all relay equipment. When an automatic trip operation occurred, the alarm bell was energized to notify the dispatcher that an operation was being recorded and the bell continued to give an alarm until the "reset" key was momentarily depressed. After the dispatcher observed the operation that had taken place, he momentarily depressed the "reset" key to release the alarm circuit. The reset key was also used to restore all equipment to normal under emergency conditions.

The Check-key is a non-locking type key designated "Check." This key was provided to enable the operator to check and verify the position of any selected unit. After the desired unit had been selected, the "check" key was momentarily depressed to initiate the operation which verified the device position.





Additional Westinghouse supervisory control equipment, which appears to post-date the Polaricode JR, functioned in a similar fashion. This Westinghouse equipment worked in tandem with the model boards and relay cabinet equipment manufactured and installed by the General Electric Company.



This diagram of the Landisville Substation, at left, shown on the model board corresponds with the controls on the Landisville control panel shown in the image, above left.

The model board constitutes a "one line diagram" which shows a simplified depiction of the electrical circuits in the systems.



In order to prevent operation of switches which controlled equipment that was out of service for repairs or otherwise, the controls were blocked with metal locking clips, as shown in the image at left.



Line selection and transfer cabinets produced by General Electric, located in the rear of the room, house relays and selectors, as well as telephone equipment for communication between the devices in the Power Director's Office and the remote substations.



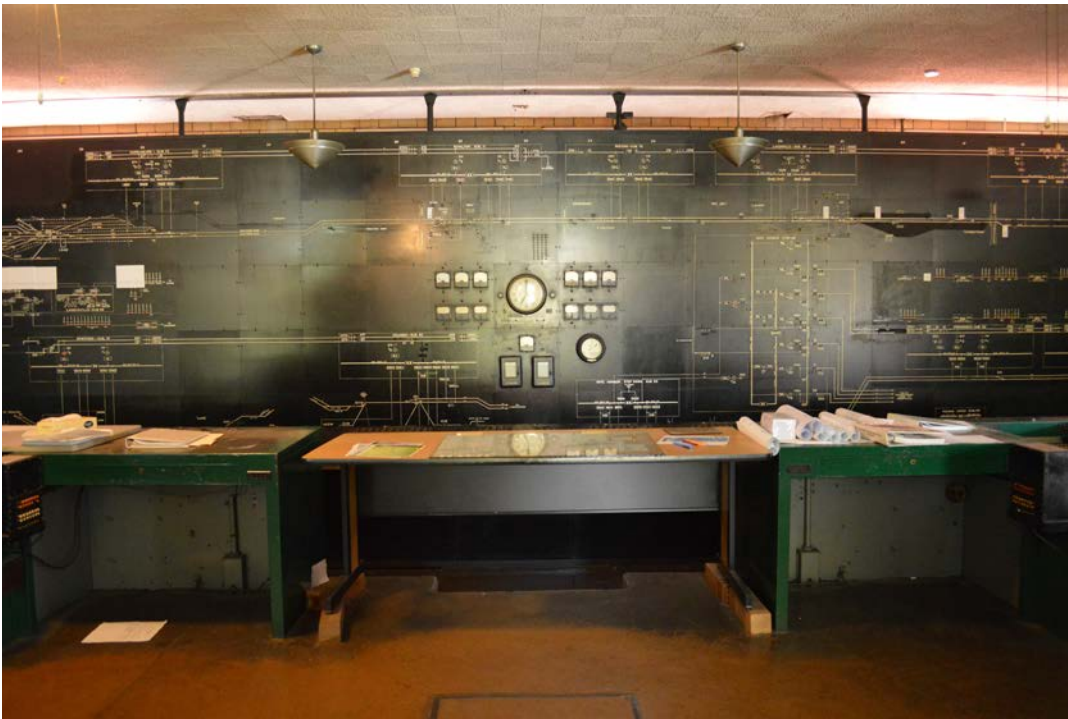
Technical literature from General Electric found in the Power Director's Room Collection at the Harrisburg Transportation Center described the equipment as follows:

“This installation comprises an independent two wire system for the normal supervision of each outlying substation. All functions of control and indication for a substation are normally accomplished over this pair of wires.

Each system of five substations also has a pair of wires for transmitting telemetering readings. The telemetering circuit is established by making a selection of the desired circuit by means of the normal supervisory equipment.

At the dispatcher's office, the equipment associated with an outlying station consists of a selection of bench board on which all keys and lamps are mounted, and a relay cabinet which contains the associated relays and selectors. Keys associated with the line grounding switches are colored red. Key and lamp positions are numbered from top to bottom and from left to right.

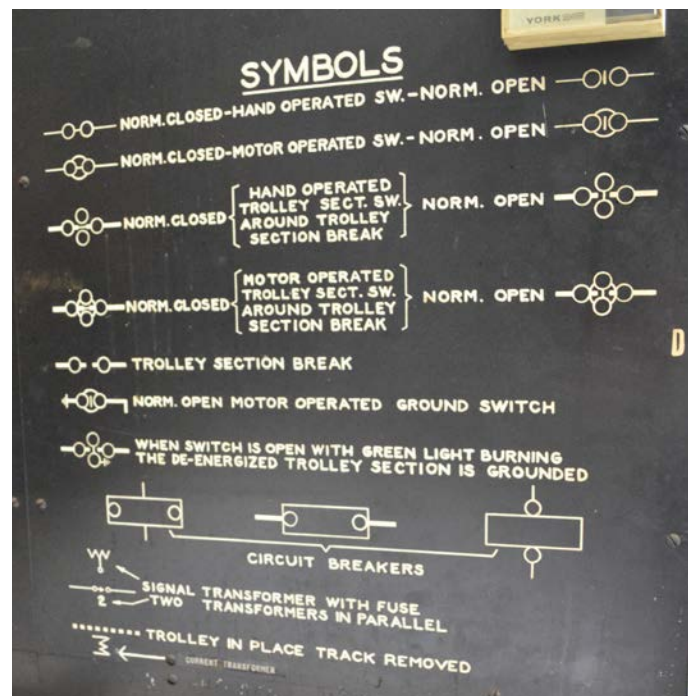
The equipment is designed to function with the Power Dispatcher's Model Board. The telemetering instruments are for mounting on the model board.”



The model boards also appear to have been constructed by General Electric. GE branded meters and dials worked in conjunction with the red and green indicator lamps on the model boards and control panels to display the system status.



Two rotating towers (left) display more detailed diagrams of the equipment at each substation, showing both the transmission lines and the connections to the catenary system. Red and green indicators functioned to display the system status and indicate whether a breaker was open or closed. A symbol key on the model boards (below) explains the symbols used to show the overview of the systems depicted on the model board and towers.





The Power Director's Office, as seen in 1985 (above).

The equipment in the Power Director's Office continued in operation until the mid-to-late 1990s, at which time the operations were switched over to a computerized control system. That system continued to be operated from a computer in the Power Director's Office at Harrisburg until c. 2013, at which time the power direction operations were moved to Amtrak's Consolidated National Operations Center (CNOC) in Wilmington, Delaware.

Today the Power Director's Office is no longer used to control the electrical power supply to the system. All of the equipment, however, remains as it was on its last day of operation. The room and equipment are used by local historic railroad organizations to offer a glimpse back in time to the old days of power operation as instituted by the Pennsylvania Railroad.



The Power Director's Office, as seen in 2018 (above).

## MAJOR BIBLIOGRAPHIC REFERENCES

Baer, Christopher T.

2015 A General Chronology of the Pennsylvania Railroad Company, Its Predecessors and Successors, and Its Historical Context - 1937. Web: [Http://www.prrths.com/newprr\\_files/Hagley/PRR1937%204-15-15.pdf](http://www.prrths.com/newprr_files/Hagley/PRR1937%204-15-15.pdf) (accessed 6/1/2018).

Berman, D.M.

1975 Pennsylvania Railroad: Harrisburg Station and Trainshed, National Register of Historic Places Nomination. Pennsylvania Historical and Museum Commission, Harrisburg.

Churella, Albert J.

2012 The Pennsylvania Railroad, Volume 1: Building an Empire, 1946-1917. Philadelphia, Pennsylvania; University of Pennsylvania Press.

Cupper, R. Daniel

1982 National Register of Historic Places Registration Form submitted for the Pennsylvania Railroad GG1 Streamlined Electric Locomotive #4859. June 15, 1982; Revised August 2002.

Froio, Michael

2012 State Interlocking. Web: <http://michaelfroio.com/blog/2012/08/02/state-interlocking> (accessed 6/1/2018).

Harrisburg Transportation Center Pennsylvania Railroad Company Collection

Various equipment manuals found among the artifacts in the Power Director's Office. Undated, publishers unknown.

Harry Weese and Associates, LTD.

1981 Pennsylvania Railroad Station, Harrisburg, Pennsylvania: Historic Structures Report. Prepared for the Harrisburg Redevelopment Authority. Harry Weese and Associates, LTD., Harrisburg.

Westinghouse Electric & Manufacturing Company

1924 Silent Sentinels: Protective Relays for AC and DC Systems. Newark, New Jersey: Westinghouse Electric & Manufacturing Company.

Yearby, J.P., and H.F. Hambright

1987 HAER No. PA-85: Pennsylvania Railroad: Harrisburg Station and Trainshed, Market & South Fourth Streets, Harrisburg, Dauphin County, PA. Historic American Engineering Record, National Park Service, Washington, DC.

Zembala, D.M.

1981 Pennsylvania Railroad, Harrisburg Station and Trainshed, National Historic Landmark Nomination. Pennsylvania Historical and Museum Commission, Harrisburg.

